Oxytropis nana Nutt., a Wyoming endemic collected by Thomas Nuttall on his journey across Wyoming in 1834

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Treasurer's Report - Balance as of October 20, 1989: $415.49; deposits: dues $56.50, donation $25.00; disbursements: newsletter printing $14.14, stamps $25.00; new balance as of February 15, 1990: $457.85. RD

Annual Meeting - The 1990 annual meeting will be held in the Big Horn Mountains on July 21-22. Details will appear in the May newsletter. RD

New State Records - Leonurus cardiaca and Lathyrus latifolius were collected in Laramie County. Both are introduced species. RD

The Lost Plant of the Wyeth Expedition by James H. Locklear (continued from last newsletter)

[In the previous episode, we learned that Parthenium alpinum was first collected by Thomas Nuttall in 1834 "In the Rocky Mountain range; latitude about 42° and seven thousand feet above the level of the sea. On shelving rocks, on the summit of a lofty hill, near the place called the 'Three Butes' by the Canadians, towards the sources of the Platte. Flowering in June." Over 100 years later in 1943, George Goodman wrote that the species had never been rediscovered and suggested central Wyoming as the likely locality. Rupert Barneby and H. Dwight Ripley then discovered in Colorado in 1946 Parthenium tetraneuris, a closely related species, and detected a pattern that also suggested central Wyoming as the locality for the lost P. alpinum.]

The summer following the discovery of P. tetraneuris, Barneby and Ripley were searching for Oxytropis nana near the town of Alcova in Natrona County, Wyoming, about thirty miles southwest of Casper. This attractive plant, like P. alpinum, was first collected by Thomas Nuttall as he crossed Wyoming in 1834. In fact, the route of the Oregon Trail and, most likely, the Wyeth Expedition, passed not too far north and west of here. As they explored the rugged, sparsely-vegetated hills to the west of Alcova, the Oxytropis was soon located. Along with it occurred a number of other plants of similar dwarf stature. It was early July and past the flowering season of these primarily spring-blooming species, so there was little to distinguish one cushion or mat from another. Yet, certain of these plants caught the attention of the two botanists.

Having seen P. ligulatum, and now P. tetraneuris, in the field, Barneby and Ripley were able to recognize a character in these non-descript mats of foliage that others would have overlooked. Had they stumbled upon P. alpinum? A careful search for flowers and fruit turned up neither. They could not really know for certain.

The only way to positively determine the identity of these plants would be to collect them in flower, sometime in May or June. Barneby contacted C. L. Porter, Professor of Botany and Curator of the Rocky Mountain Herbarium at the University of Wyoming and requested that he make an effort to travel to the vicinity the next year to collect additional specimens.

On May 9, 1948, Professor Porter made the trip to the Alcova area. Although the weather had been "unpleasantly cold," his efforts were amply rewarded. There, on the reddish clayey soil, plants of P. alpinum were found "in abundance and in full bloom." As if this were not enough, Porter also found Townsendia spathulata in the vicinity. This rare plant was another of Nuttall's discoveries from the Wyeth Expedition and had been collected only one other time since 1834. Porter was probably not far from the locale where, 114 years earlier, Thomas Nuttall discovered P. alpinum. The lost plant of the Wyeth Expedition had been found.

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The Nature Conservancy Expands in Wyoming - TNC opened a Wyoming Field Office in July in Lander, under the directorship of Ben Pierce. Ben is a Mainiac who made his way to Wyoming by way of TNC's Big Sky Field Office in Montana. Ben's first impressions of Wyoming have been extremely favorable. He especially likes the wide fast roads and ultimate brownies. In January, the Wyoming Natural Diversity Database, TNC's natural heritage program for Wyoming, added a zoologist to the staff. Chris Garber refuses to reveal his true origins, but he has spent the past several winters in Washington, and summers in the Brooks Range of Alaska. The program continues to be housed in the Rocky Mountain Herbarium through a Memorandum of Understanding with the University of Wyoming. Chris' colleagues are Hollis Marriott, Botanist, George Jones, Plant Ecologist, and Mary Neighbours, Information Manager. HM

Intermountain Flora, Volume 3B, Now Available - This volume by Rupert C. Barneby covers the Fabales (families Mimosaceae, Caesalpiniaceae, and Fabaceae) commonly known as the legumes. This volume of 280 pages follows the format of previous volumes. The price (in US) of $61.65 includes postage. Available from The New York Botanical Garden, Scientific Publications Department, Bronx, NY 10458.

Wyoming Endemics

Cymopterus evertii Hartman & Kirkpatrick — Evert's Cymopterus

This member of the carrot family was first collected by David Martin on April 8, 1981, in Park County. It was collected by several others in the same year and in the following three years in Park and Hot Springs counties. Ron Hartman and Rob Kirkpatrick described the species in 1986. The plants average about 6 inches high with a rosette of basal leaves that are finely divided. The petals are white or cream colored and barely over 1/16 inch long. The plants grow in rocky or sandy places in the Absaroka Mountains and the adjacent Big Horn Basin.

Phlox pungens Dorn — Pungent Phlox

This member of the Phlox family was first collected by Robert Dorn on June 2, 1984, on Beaver Rim in Fremont County. It was next collected by Ron Hartman with June Haines on May 31, 1985. It was described by Dorn in 1988. The plants form loose mats about an inch or two high. The leaves are very stiff, pungently sharp, and about 1/4 inch long. The corolla is white and about half an inch long. The plants grow on rocky calcareous slopes and sandy areas on and near Beaver Rim in Fremont County. RD

Growing Wild Plants From Seed

The vast majority of seeds in nature never produce a mature plant. That is why many plants produce large quantities of seed. The most critical periods in a plant's life cycle are the seed and seedling stages. These young plants have no parents to protect them from the hazards of life. We can provide that protection and increase a plant's chances for survival from near zero to near certainty.

Storage of Seeds

The most basic need of a seed is protection from being eaten by a seed-eating animal (except those seeds naturally adapted to use this as a means of dispersal such as those in berries and other fleshy fruits). Seed-eating animals include insects that may be smaller than the seed itself. Molds and other kinds of fungi are also enemies of seeds. Proper storage will protect seeds from these hazards. Seeds should be stored dry in sealed glass or hard plastic containers placed in a refrigerator (34-41°F). The shorter the storage term, the better.

Seed Dormancy

Some seeds, especially those of trees and shrubs, have a dormancy period which must be broken before they will germinate. The simplest can be broken by soaking the seeds for a day or so or by scarification. The more difficult require after-ripening and/or stratification.

Scarification

Scarification can be accomplished by nicking the seed coat with a razor blade to allow water to penetrate. Be sure the coat is penetrated but be careful not to cut into the embryo inside. This procedure is commonly used for seeds of the pea family.

Stratification

Cold stratification requires cold temperatures (34-41° F) along with some moisture and air. The only things needed are some refrigerator space, small sealable plastic bags, and a little sterile peat moss or other moisture retaining medium like sterile sand or vermiculite (coffee filters may also work and are preferred for tiny seeds). The peat moss should be granulated. To sterilize, place in a shallow pan in a 180° F oven for 30 minutes (this may cause a strong odor if done indoors). The moisture retaining medium need only be about 3 times that of the seeds but more will retain moisture better. Thin plastic bags breathe to some extent. Thicker containers must be kept slightly open at all times. First soak the seeds for 12-24 hours. Then place the seeds and moist medium into the plastic bags (medium should be moist, not soggy) and seal. Place in the refrigerator but do not freeze. Open bags weekly for the first couple of weeks to let in air and make sure moisture is being retained. If mold is observed, treat with a fungicide. Thereafter, check weekly for drying or mold but only open every 3-4 weeks. If the seeds begin to sprout, remove and plant. Stratification takes generally 20 to 120 days depending upon the species. Most take less than 60 days. Plant seeds immediately after removal to prevent a second dormancy. Rinse seeds before planting.

After-ripening

After-ripening requires warm temperatures. Only a few species fall in this category.

Starting Seeds Indoors

Starting seeds indoors allows taking the plants through the critical seedling stage with special care and protection. Ideally, some seed should be saved for direct planting outdoors, especially for those few species that do not tolerate transplanting very well. Planting in containers such as peat pots will reduce transplanting stress to a minimum. These pots only need to be partly removed when transplanting. When starting seeds indoors, it is best to provide an alternating temperature, warm during daylight, cool at night. A 20 to 30 degree difference is desirable. If this is not possible, keep in a warm area (about 70° F for most seeds) until the seedlings emerge, then place in a cool area (50-60°). Start seeds indoors 6 to 8 weeks before the last danger of frost. Seeds should never be covered with soil deeper than 3 times their diameter. Some seeds, especially small ones, should simply be pressed into the soil surface as they may require light to germinate. Soaking large seeds for 12 to 24 hours before planting will speed germination. The soil mixture should be sterilized and the surface of the mix should be very fine to allow the seeds to receive adequate moisture for germination. A good soil mixture is 1 part sand, 1 part sphagnum moss, and 1 part loamy soil. The container should have good drainage at the bottom. Moisten the soil until wet but not soggy. Provide good light but keep from direct sun. Space the seeds at least 1 inch apart if grown in a common container. Do not allow the soil to dry out or get water-logged. A plastic bag can be placed over the containers to retain moisture, but do not let the plastic touch the soil. This should be removed as soon as the seedlings emerge. A mist sprayer is desirable for watering containers that have small seeds. Do not transplant before three or four true leaves (not seed leaves) are visible. Before transplanting, be sure to first harden off the seedlings by placing them outdoors during the daytime for a week or two and then a couple of days overnight as well.

Enemies of Seedlings

There are four major enemies of plant seedlings: no water, too much water, fungi, and animal consumers. The seedbed must be kept constantly moist, not wet, until the seedlings are well established. This can be made easier by providing a proper soil mixture and suitable drainage. Fungi cause "damping off," a rotting of the seedling at ground level resulting in death of the plant. It is most troublesome when starting plants in containers, particularly indoors. Periodic spraying with a fungicide will help control this problem. Keeping the plants well spaced and well aerated will also help. Animal consumers, mainly rabbits, rodents, and insects, can be excluded by screening or other control measures. When transplanting, do not crowd the plants. Many wildflowers cannot tolerate competition, including that from weeds. Provide wind protection initially, if necessary.

Outdoor Soils

The best soil provides good drainage (except when growing wetland plants) yet is able to retain moisture, provides good aeration, provides necessary nutrients, and is at a suitable pH (acidity or alkalinity). It is best to

provide additives to your soil to meet these conditions. Good drainage and aeration are achieved by adding sand and/or fine gravel to equal about half of the total soil volume. Special drainage procedures are discussed below. Moisture retention is achieved by adding organic matter such as leaf mold, compost, or peat moss. Naturally clayey soils will already have moisture retaining ability. Organic matter also provides nutrients. Normally, artificial fertilizers should not be used. Most drier parts of the country tend to have alkaline soils (pH 7-9) except in swampy areas or conifer forests. Wet areas of the country tend to have acid soils (pH 5-7). Soil can be made more alkaline by adding limestone chips or powder. This can be combined with providing drainage by using limestone gravel. Soil can be made more acid by adding pine needles, sphagnum moss, or aluminum sulfate. The surface layer of the soil should be fine to provide good physical contact with the seeds. If it is coarse, the seeds will not be able to absorb sufficient moisture from the soil to germinate. If adding soil, a recommended mix is 2 parts sand, 1 part limestone chip (non-limestone gravel if acid soil is needed), 1 part peat moss or leaf mold, and 1 part clay loam or loam. Do not cover seeds with soil deeper than 3 times their diameter. Small seeds should simply be pressed into the soil surface. The surface must be kept constantly moist until the seedlings are established.

Special Drainage

Some wildflowers, including cacti, require very good drainage and dry conditions during late summer and winter (frozen soil is a dry soil that meets the winter requirement). The best way to provide these conditions is to locate the growing area in direct sun on a high spot, preferably with a slope toward the sun. In areas of the country that are not naturally dry, excavate the area to be planted and place a sublayer of stone from about egg size to softball size to a depth of 6 to 12 inches. Sand may also work if stone is not available. Replace the soil to a depth of 6 to 12 inches and at least level with the surroundings. Do not water except to keep the seed bed and young seedlings moist or if there is a prolonged drought during the flowering season or before. Raised beds may also help to provide good drainage.

Characteristics of Wild Seed

Because of uncertain conditions in nature, many plants have developed mechanisms that prevent all seeds from germinating at the same time. In case the first germination is a failure, there will then be other seeds left to germinate later. As a result, the germination percentage of wildflower seeds may be much lower than vegetables and other cultivars. Just because a seed does not germinate in a timely manner doesn't mean that the seed in not good. Seeds planted outside should not be given up as lost until at least two growing seasons pass. RD

Contributors This Issue - RD = Robert Dorn, JL = Jim Locklear, HM = Hollis Marriott.

Wyoming Native Plant Society T-Shirts are still available for $9.00 per shirt plus $2.50 for shipping. Sizes are S(34-36), M(38-40), L(42-44), and XL(46-48). Color is blue and green on cream background. Make checks payable to Mary Neighbours and mail to her at Box 3165, University Station, Laramie, WY 82071.

Nominations - Nominations for President, Vice-President, Secretary-Tresurer, and Board Member are needed by May.

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